

PROCEEDINGS
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DESCRIPTIONS OF FOUR NEW TREESHREWS.

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During his recent Zoological explorations of the Malayan Archipelago, Dr. W. L. Abbott collected, among numerous other mammals, representatives of four species of treeshrews which have not been previously described. They may be known by the following descriptions.

***Tupaia raviana* sp. nov.**

Type.—Skin and skull, old adult male, Cat. No. 104,355, U. S. N. M., Pulo Rawi, Butang Islands, off west coast Malay Peninsula, Dec. 18, 1899, Dr. W. L. Abbott. Orig. No. 172.

Diagnostic characters.—Related to *T. belangeri* of the neighboring mainland and *T. lacernata* of Pulos Langkawi and Terutau, but skull generally wider, and rostrum especially thicker and wider, interorbital region wider, zygomata more spreading; skin rather intermediate between the two, but more like that of *T. belangeri*.

Color.—Type: Upperparts of head, neck, body, and outer side of legs a grizzle of a color between buff and olive-buff, and blackish, the two colors about equally mixed, and the buffy color inclining toward ochraceous buff in the region of the thighs; underparts generally buffy or an extremely pale gallstone yellow; tail a fine grizzle of cream color and blackish, the latter predominating above and both about equally prominent below except in the middle line where the lighter color is in excess; shoulder stripe not conspicuous, dull cream color.

Skull.—In general like that of *T. belangeri* and *T. lacernata*, but the skull is generally wider, with thicker and wider rostrum and more spreading zygomata. This shows more differences from the related forms than does the skin.

Measurements.—Type, and Cat. No. 123,984, U. S. N. M., *Tupaia lacernata*, an old adult male from Pulo Terutau: Head and body, 184, 180; tail, 165, 145; hind foot (dry), 46, 44; condylobasal length of skull, 46.5, 46; zygomatic width, 25.5, 24.5; width of braincase above

zygomata, 19.19; maxillary tooththrow, alveoli, 17.5, 18; width of rostrum back of incisors, 7, 6.5.

Specimens examined.—Two, the type and Cat. No. 104,354, U. S. N. M., from Pulo Adang, Butang Islands.

***Tupaia pemangilis* sp. nov.**

Type.—Skin and skull, adult female, Cat. No. 112,499, U. S. N. M., Pulo Pemangil, east coast Malay Peninsula, June 12, 1901, Dr. W. L. Abbott, Orig. No. 1064.

Diagnostic characters.—A member of the *ferruginea* group closely related to *T. sordida* from Tioman, but slightly duller in color, with slightly grayer feet, and with anterior portion of underparts more buffy, much like that of *T. pulonis* from Pulo Aor.; skull like that of *sordida*, but slightly narrower, and with m^3 rather smaller.

Color.—Type: Upper parts a grizzle of dull tawny ochraceous and blackish, brightest on posterior parts of body, and lightening anteriorly on neck and head to a grizzle of raw sienna (or gallstone yellow) and blackish; outer side of forelegs like top of neck; outside of hindlegs, like lower back; shoulder stripe moderately conspicuous, between buff and olive buff; throat and chest pale dull buffy; inner sides of legs dull buffy with darker bases of the hairs showing through; tail above a uniform grizzle of cream color and blackish, both colors about equally prominent; below a coarse grizzle of dull buff and black, the buff color predominating along central line; hands and feet a fine grizzle of the colors of the adjacent parts.

Skull and teeth.—Very similar to those of *Tupaia sordida* from the nearby Pulo Tioman, but skull slenderer, and with m^3 rather smaller, and with slightly smaller bulke.

Measurements.—Type and the type of *Tupaia sordida*, Cat. No. 101,747, U. S. N. M.: Head and body, 185, 171; tail, 150, 165; hindfoot (dry), 40, 41; condylobasal length of skull, 45, 46; zygomatic width, 23, 25.5; width of braincase above roots of zygomata, 19, 20; maxillary tooththrow, alveoli, 17.5, 18.5.

Specimens examined.—One, the type.

Remarks.—*Tupaia pemangilis* is only a slightly differentiated form, and were it not for its insular isolation could not be considered more than a subspecies. It is most closely related to *T. sordida* of Pulo Tioman and is not distantly removed from *T. pulonis* of Pulo Aor. The three islands Aor, Tioman, and Pemangil are thus inhabited by Tupaia of the *ferruginea* group differing slightly from each other and as a whole from the mainland form.

***Tupaia natunae* sp. nov.**

Type.—Skin and skull of rather old adult female, Cat. No. 104,714, U. S. N. M., collected on Bunguran, Natuna Islands, June 27, 1900, by Dr. W. L. Abbott, Orig. No. 514.

Diagnostic characters.—Related to *Tupaia splendidula* of Borneo from which it differs in a generally brighter and more reddish coloration of the upperparts, sides, legs and tail, and more inflated braincase.

Color.—Type: General color effect of upperparts of neck and body, in fresh pelage, most like Ridgway's burnt sienna, but rather brighter, this color being produced by a wide band on most of the hairs, of a bright ferruginous burnt sienna mixture, with blackish bases and a considerable number of long blackish hairs; on rump, where an old pelage persists, the general color darker and duller; sides of body and outer side of legs similar to upperparts, but showing a tendency to grizzling; top of nose a grizzle of raw sienna and blackish gradually blending in on top of head with color of upperparts; cheeks and sides of neck an indistinct grizzle of blackish and buff olive; shoulder-stripe buffy to ochraceous buff; an indistinct buffy ochraceous eye ring; underparts generally a color between buff and olive-buff; inner side of legs essentially like sides of body, but rather lighter; tail above generally like back, but in dull worn pelage; underside of tail and bases of tail hairs generally, tawny ochraceous, with the outer and terminal margins of tail dark tawny. A paratype, a barely adult female, is generally like the type in color, but shows distinct grizzling on sides of body, on neck, shoulders and thighs, and indistinct grizzling on upperparts generally.

Skull and teeth.—These are of the same general form as they are in *T. splendidula*, the skull averages longer, however, has a more inflated braincase, and the teeth are distinctly larger.

Measurements.—Type and those of Cat. No. 151,883, *T. splendidula*, from Klumpang Bay, southeastern Borneo; head and body, 184, 189; tail, 140, 130; hindfoot, 40, 41; condylobasal length of skull, 46, 44; zygomatic width, 25, 25; width of braincase above roots of zygomata, 19, 17.5; maxillary toothrow (alveoli), 18.5, 17.

Specimens examined.—Two, the type, and skin and skull, Cat. No. 104,715, a young adult female, also from Buguran Island.

***Tupaia sincepis* sp. nov.**

Type.—Skin and skull of adult male, Cat. No. 123,105, U. S. N. M., collected on Pulo Singkep, Rbio-Linga Archipelago, August 8, 1903, by Dr. W. L. Abbott, Orig. No. 2732.

Diagnostic characters.—A slightly differentiated form of *Tupaia malaccana* with a more rufescent color on the back, and with a darker and more blackish tail.

Color.—Type: Upperparts of head, neck, and body, and outer side of legs, a fine grizzle of buff and blackish, the buff color being gradually replaced by tawny ochraceous on the lower back, rump, and base of tail; underparts varying from pale buff, or cream color anteriorly to dirty whitish posteriorly; inner side of legs similar to adjacent portions of underparts; tail, above, an indistinct grizzle of ochraceous buff and black, the latter color in excess especially along margin and tip of tail; middle portion of underside of tail cream buff finely lined with blackish, outer

portion and tip generally blackish with a slight admixture of buff or ochraceous buff; upper surfaces of feet ochraceous buff with the dark bases of the hairs showing through; eye ring, fairly well defined buffy; shoulder stripe, well marked, whitish. The rest of the series are essentially like the type, but three of them are more tawny about the rump and base of tail.

Skull and teeth.—These show no special characters by which *Tupaia sincepsis* can be distinguished from *T. malaccana*.

Specimens examined.—Six, the type and five others, all from the island of Singkep.

Measurements.—Head and body, 140; tail, 165; hind foot, 37; condylo-basal length of skull, 36.5; zygomatic width, 20.5; width of braincase above roots of zygomata, 16.5, maxillary toothrow (alveoli), 13.

Remarks.—*Tupaia sincepsis* is very closely related to *T. malaccana* from the Malay Peninsula. Specimens from the islands of Linga and Sumatra appear to be rather intermediate between the two forms, those from Sumatra being more like the Peninsular animal. The Linga specimens resemble *T. sincepsis* in having a tawny color on the back, but lack the darker tail.